sight during one half its period, and visible during the other half; while the observations of Mr. Rock show that it goes through all its changes within the short interval of $21\frac{1}{4}$ hours. Another in the constellation of the "Southern Triangle," which has been regularly observed by Mr. Davis, exhibits regular fluctuations of light, comprised within a period of about $3\frac{1}{2}$ days, similarly alternating between visibility and invisibility. These two exhibit the most rapid changes of any of the stars which we have hitherto observed; but there are others not less interesting, observed not only by the two gentlemen mentioned, but also by Messrs. Thorne and Hathaway, who are likewise pursuing these investigations with much success."

NOTES

THE retirement of Prof. Huxley from the London School Board throws a great responsibility upon the men of Science in London in general, and on Marylebone in particular. We are of opinion that of all the good work which Prof. Huxley has done, none will have a more lasting national importance than that which has resulted in the introduction of Science among the subjects to be taught in the London schools—and, therefore, in all the School-Board-schools throughout the country, for the force of public opinion will, in the long run, insist that the London model shall be everywhere followed. It is because we fear that this important advance may be arrested, unless steps are taken still to have the claims of Science represented on the Board, that we draw attention to the subject, which, in our opinion, is of sufficient importance to occupy the attention of the Royal Society, and the other scientific bodies, if their aid is necessary. Doubtless membership of the School Board involves sacrifice; but it is to be hoped that the clerical squabbles which have so interfered with the desired progress here, as it did, ineffectually, in other countries, are now as nearly over as they ever will be; and if this be so, then, instead of the 170 sittings given by some members last year, a much smaller number will suffice.

WE have reason to know that many weak people have been alarmed, and many still weaker people made positively ill, by an announcement which has appeared in almost all the newspapers, to the effect that Prof. Plantamour, of Geneva, has discovered a comet of immense size, which is to "collide," as our American friends would say, with our planet on the 12th of August next. We fear that there is no foundation whatever for the rumour. In the present state of science nothing could be more acceptable than the appearance of a good large comet, and the nearer it comes to us the better, for the spectroscope has a long account to settle with the whole genus, which up to this present time has fairly eluded our grasp. But it is not too much to suppose that the laymen in these matters might imagine that discovery would be too dearly bought by the ruin of our planet. Doubtless, if such ruin were possible, or indeed probable—but let us discuss this point. Kepler, who was wont to say that there are as many comets in the sky as fishes in the ocean, has had his opinion endorsed in later times by Arago, who has estimated the number of these bodies which traverse the solar system as 17,500,000. But what follows from this? Surely that comets are very harmless bodies or the planetary system, the earth included, would have suffered from them long before this, even if we do not admit that the earth is as old as geologists would make it. But this is not all. It is well known that some among their number which have withal put on a very portentous appearance are merely the celestial equivalents of our terrestrial "wind-bags"—brought down to their proper level they would have shrunk into very small dimensions indeed. But there is more comfort still. The comet of 1770 positively got so near to Jupiter that it got entangled among his moons, the diameter of the smallest of which is only some 2,000 miles; but the moons pursued their courses as if nothing had happened, while the comet was so discomfited by the encounter that it returned by another road—*i.e.* astronomically speaking, its orbit was entirely changed. While, last of all, in our correspondence this week, will be found one fact the more in favour of the idea that, in 1861, we actually did pass through a comet. We have a suggestion for those weak people who are still alarmed by these celestial portents, and steadily refuse to acquaint themselves with the most elementary work on Astronomy, which would convince them how groundless their fears are. In India, during the last Eclipse, the priests reaped magnificent harvests from the offerings of the faithful. In England, possibly, it would be considered incorrect to make such offerings to the priest; but let them still be made—to the Royal Astronomical Society. In this way the English Philistine would approach nearer the standard of his less-civilised brother; Science would be benefited, and, doubtless, the omen would be averted —at all events they always have been.

THE Anniversary Meeting of the Royal Astronomical Society was held on Friday last, when the president's address was read. The medal this year has been awarded to Prof. Schiaparelli for his brilliant demonstration of the identity which exists in the elements of the orbits of certain comets and known systems of meteors. Among the obituary notices for the year were those of Sir John Herschel, Prof. De Morgan, and Mr. Babbage.

THE Council of the Geological Society have awarded the Wollaston Medal for the present year to Prof. J. D. Dana, of Yale College, Connecticut, and the balance of the proceeds of the Wollaston Fund to Mr. James Croll, of Edinburgh.

THE Hopkins Prize, which was founded in memory of the late Mr. Hopkins, and is adjudged to the author of the best original memoir, invention, or discovery in connection with Mathematico-physical or Mathematico-experimental Science that may have been published during the three years immediately preceding (who is or has been a member of the University of Cambridge) has been awarded to Prof. J. Clerk Maxwell, F.R.S. The adjudicators were Profs. Stokes, Tait, and Clifton. The fund is vested in the Cambridge Philosophical Society.

WE learn that, in addition to the scholarships for Natural Science at Cambridge, of which a list was given in our number for February 1, King's College offers an exhibition of the value of about 80*l.* per annum. The examination will commence on April 9, will include Physics, Chemistry, and Physiology, with one Classical and one Mathematical paper, and will be open to all candidates under twenty, and to undergraduates of the college in their first and second year. Names must be sent in, before March 10, to the Rev. A. A. Leigh, tutor of the college, from whom further information may be obtained.

PROF. GEORGE ROLLESTON has been elected a Fellow of Merton College, under the ordinance of 1854, which founded the Linacre Professorship of Physiology, and endowed it out of the revenues of this college. Prof. Rolleston graduated in 1850, and was afterwards elected Fellow of Pembroke College. In 1860 he was appointed to the Linacre Professorship of Physiology.

THE Industrial Museum at Edinburgh has lost, by the death of J. Boyd Davies, its zoological director or manager. No one knows what the authorities are going to do, but it is to be hoped they will select a good man, not a talker but a worker. The monetary value of the post is 200*l.* to 250*l.* per annum. The Lectureship on Zoology at the High School is also vacant.

AT a meeting of the Royal Geographical Society held on Monday evening last, the president, Sir H. C. Rawlinson, stated that, three days before, the expedition, consisting of Lieut. Dawson, R.N., Lieut. Henn, R.N., and Mr. Oswald Livingstone, the son of Dr. Livingstone, set sail in the first steamer despatched from the Thames to Zanzibar direct. The three gentlemen engaged in it had been given every assurance that their undertaking would be assisted at home in every possible way. The subscriptions to the fund for its maintenance amounted to 5,000*l.*, of which upwards of 2,000*l.* was received from London alone; Edinburgh had contributed 350*l.*; and the little town of Hamilton, the native place of Dr. Livingstone, 200*l.*; while the corporation of the City of London had subscribed one hundred guineas, and the leading commercial firms of the City had come forward in an equally liberal manner. The Admiralty has refused to allow Lieut. Dawson his full pay while engaged on the expedition.

The important article which we are able to give this week, on the Position of the Centre of Gravity in Insects," by M. Felix Plateau, is an abstract of a long memoir by that author, to be found in the "Bibliothèque Universelle, Archives des Sciences Physiques et Naturelles," vol. xliii., for 1872.

The *Naval and Military Gazette* asserts that the *Challenger*, screw corvette, will be commissioned early in the summer for a voyage of exploration and research. Some scientific gentlemen will be accommodated on board the vessel, and it is probable that Captain George S. Nares, now serving in the surveying vessel *Shearwater*, in the Red Sea, will be placed in command. The actual places which will be visited have not yet been determined, but it is anticipated that the groups of islands in the Pacific will have special attention bestowed upon them. This movement on the part of the Admiralty is in encouraging contrast to the fact that Arctic voyages have been abandoned to other nations, and to the late refusal of the Lords of the Treasury to grant any assistance whatever to the Livingstone search expedition.

The following is the list of officers and council of the Royal Microscopical Society elected on the 7th of February:—President—Mr. W. K. Parker, F.R.S. Vice-Presidents—Dr. W. B. Carpenter, F.R.S., Dr. J. E. Gray, F.R.S., Sir John Lubbock, Bart., M.P., F.R.S., Mr. John Millar. Treasurer—Mr. John W. Stephenson. Secretaries—Mr. Henry J. Slack, Mr. Jabez Hogg. Council—Dr. Robert Braithwaite, Mr. John Berney, Mr. Charles Brooke, F.R.S., Mr. T. W. Burr, Dr. W. J. Gray, Dr. Henry Lawson, Mr. Henry Lee, Mr. S. J. M'Intire, Mr. Henry Perigal, Dr. G. W. Royston-Pigott, Mr. Charles Stewart, Mr. T. C. White.

The International Scientific Series, to be published by Henry S. King and Co., is an indication of a movement of great importance. The series will be published simultaneously in New York by Messrs. D. Appleton and Co., in Paris by M. Germer Baillière, and in Leipzig by Messrs. Brockhaus. The first volume, by Prof. Tyndall, F.R.S., on "The Forms of Water, in Clouds, Rain, Rivers, Ice, and Glaciers," is now in the press, and will be published in March next. Among others already arranged for are Prof. T. H. Huxley, F.R.S., on Bodily Motion and Consciousness; Dr. W. B. Carpenter, F.R.S., on the Principles of Mental Physiology; Sir John Lubbock, Bart., F.R.S., on the Antiquity of Man; Prof. Rudolph Virchow, on Morbid Physiological Action; Prof. Alexander Bain, on Relations of Mind and Body; Prof. Balfour Stewart, F.R.S., on the Conservation of Energy; Mr. Walter Bagehot, on Physics and Politics; Dr. H. Charlton Bastian, F.R.S., on the Brain as an Organ of Mind; Mr. Herbert Spencer, on the Study of Sociology; Prof. William Odling, F.R.S., on the New Chemistry; Prof. W. Thiselton Dyer, on Form and Habit in Flowering Plants; Dr. Edward Smith, F.R.S., on Food and Diets; Prof. W. Clifford, on the First Principles of the Exact Sciences explained to the non-mathematical; Mr. J. N. Lockyer, F.R.S., on Spectrum Analysis; Dr. W. Lauder Lindsay, on Mind in the Lower Animals; Dr. J. B. Pettigrew, F.R.S., on Animal Locomotion; Prof. A. C. Ramsay, F.R.S, on Earth Sculpture; Dr. Henry Maudsley, on Responsibility in Disease; Prof. W. Stanley Jevons, on the Logic of Statistics; Prof. Michael Foster, on Protoplasm and the Cell Theory; Rev. M. J. Berkeley, on Fungi: their nature, influences, and uses; Prof. Claude Bernard, on Physical and Metaphysical Phenomena of Life; Prof. A. Quetelet, on Social Physics; Prof. H. Sainte-Claire Deville, Introduction to General Chemistry; Prof. Wurtz, on Atoms and the Atomic Theory; Prof. Quatrefages, on the Negro Races; Prof. Lucaze-Duthiers, on Zoology since Cuvier; Prof. Berthelot, on Chemical Synthesis.

The death of Dr. Harvey, Professor of Botany in the University of Dublin, arrested the progress of the Flora Capensis shortly after the publication of the third volume had brought the work half-way towards its completion. It is hoped that if the Cape Legislature will accede to Dr. Hooker's request for a renewal of the grant towards the expenses of printing, the remaining volumes may be at once taken in hand. The general supervision will be undertaken by Prof. Thiselton Dyer, who will probably receive assistance in monographing different families from Profs. Lawson and Perceval Wright, Drs. Sonder, Trimen, Masters, and MacNab, and from Messrs. Carruthers, A. W. Bennett, Hiern, Britten, and Baker.

Dr. Miller Coughtrey is engaged on a long paper on the long-handled combs, Roman, Swiss, bone cave, Mexican, and other forms. It is now in proof for the Proceedings of the Antiquarian Society of Scotland.

We note the appearance of the first number of a new monthly magazine, "The Earth: a popular magazine on Geology," whose object is "to collate and bring together facts and discoveries bearing on advanced and truthful views of Geology, and to oppose false and current opinions on the subject." Among the fallacies to be exposed are:—"That there has been an evolution of one creature into another," "that vegetable life either preceded or succeeded animal life on the globe," "that granite is a rock of fusion," &c.; and among the truths to be advocated are:—"That the configuration of the earth is a result of the agency of the winds and tides, of volcanic action, and of fluviatile and glacial action," "that there has been no evolution of species," and "that basalt is a crystallisation from solutions."

We are glad to see that the labours of the English Strasburg Library Committee, consisting of Mr. Hepworth Dixon, Lord Houghton, Prof. Huxley, Lord Lytton, the Duke of Manchester, Sir J. G. Tollemache Sinclair, Bart. M.P., and Mr. Trübner, secretary, are being crowned with success. From the list we have just received of books already presented, we see that almost every department of Government has presented its publications. This remark also applies to the following scientific societies:—The University of Oxford, the Trustees of the British Museum, the Astronomer Royal, the Royal Geographical Society, the Royal Society of Edinburgh, the Botanical Society of Edinburgh, the Early English Text Society, the Historic Society of Lancashire and Cheshire, the Meteorological Society, the Radcliffe Observatory, Oxford, the Royal United Service Institution, the Philosophical Society of Glasgow, the Royal Institution of Great Britain, and Owens College, Manchester. In this list we may remark that some of the most important of our societies are still conspicuous by their absence.

The problem, "What to do with our juvenile criminals," appears to have been solved by the Government of the State of New York in a most satisfactory manner. We have before us, and hope to be able to return to it again, a pamphlet issued by the "Department of Public Charities and Correction," bearing the title, inexplicable to English bumbledom, of "Cruise of School-ship *Mercury* in Tropical Atlantic Ocean." It is, in fact, an account of a cruise undertaken in the interests of science, and under the management of Prof. Henry Draper, containing a report "on the chemical and physical facts collected from the Deep Sea Researches made during the voyage of the nautical school-ship *Mercury*, undertaken in the Tropical Atlantic and Caribbean Sea in 1870-71; the "cruisers" being, not Dr. Carpenter, Prof. Wyville Thomson, and Mr. Gwyn Jeffreys, but the boys committed to the care of the Commissioners in New York for slight misdemeanours and vagrancy!

WE regret to hear that the Geology Class at Christ's Hospital, having gone through an introductory course of lectures, has stopped, and has not been replaced by a class of Botany or any sister science. It is greatly to be regretted that the Chemistry Class do not get beyond the simpler metals and easy testing; those who would wish to study Chemistry are restricted to the more elementary branches of inorganic chemistry alone.

PROF. HUGHES, F.R.G.S., gave two lectures at Christ's Hospital on February 3 and 10 on Physical Geography. In his introduction he, like Prof. Huxley, claimed for his science a position equal to that held by the German Erdkunde, defining both to be that which explained to us "the aspect of nature and natural phenomena." In his first lecture he dealt with "High Lands and Table Lands," somewhat overthrowing the popular idea of mountains gained from text books. In his second lecture he spoke of the "Ocean and Deep-Sea Currents," explaining clearly and advocating warmly the ingenious theories and proofs of Dr. Carpenter, about which there has been so much discussion in the pages of NATURE. We attach no little importance to these lectures, because they brought the hearers up to the present state of our knowledge of the deep sea and of the Himalayan Mountains, far further than the best text-books have yet brought us. It is only to be regretted that other gentlemen of like abilities and knowledge with Prof. Hughes do not come forward and offer to lecture to boys on other branches of Natural Science. It is hard for those who feel an interest in nature to feel themselves bound by the iron chains of verse composition.

Lippincott's Magazine for January contains an interesting and profusely-illustrated article on the New Port Storm Signals, by Prof. Thompson B. Maury.

PHYSICS

Preliminary Catalogue of the Bright Lines in the Spectrum of the Chromosphere*

THE following list contains the bright lines which have been observed by the writer in the spectrum of the chromosphere within the past four weeks. It includes, however, only those which have been seen twice at least; a number observed on one occasion (Sept. 7) still await verification.

The spectroscope employed is the same described in the Journal of the Franklin Institute for November 1870; but certain important modifications have since been effected in the instrument. The telescope and collimator have each a focal length of nearly 10 inches, and an aperture of $\frac{7}{8}$ of an inch. The prism-train consists of five prisms (with refracting angles of 55°) and two half-prisms. The light is sent twice through the whole series by means of a prism of total reflection at the end of the train, so that the dispersive power is that of twelve prisms. The instrument distinctly divides the strong iron line at 1961 of Kirchhoff's scale, and separates B (not b) into its three components. Of course it easily shows everything that appears on the spectrum maps of Kirchhoff and Angström. The adjustment for "the position of minimum deviation" is automatic; *i.e.*, the different portions of the spectrum are brought to the centre of the field of view by a movement which at the same time also adjusts the prisms.

The telescope to which the spectroscope is attached is the new equatorial recently mounted in the observatory of the College by Alvan Clark and Sons. It is a very perfect specimen of the admirable optical workmanship of this celebrated firm, and has an aperture of $9\frac{4}{10}$ inches, with a focal length of 12 feet.

In the table the first column contains simply the reference number. An asterisk denotes that the line affected by it has no well-marked corresponding dark line in the ordinary solar spectrum.

The second column gives the position of the line upon the scale of Kirchhoff's map—determined by direct comparison with the map at the time of observation. In some cases an interrogation mark is appended, which signifies not that the existence of the line is doubtful, but only that its precise place could not be determined, either because it fell in a shading of fine lines, or because it could not be decided in the case of some close double lines which of the two components was the bright one; or, finally, because there were no well-marked dark lines near enough to furnish the basis of reference for a perfectly accurate determination.

The third column gives the position of the line upon Angström's normal atlas of the solar spectrum. In this column an occasional interrogation mark denotes that there is some doubt as to the precise point of Angström's scale corresponding to Kirchhoff's. There is considerable difference between the two maps, owing to the omission of many faint lines by Angström, and the want of the fine gradations of shading observed by Kirchhoff, which renders the co-ordination of the two scales sometimes difficult, and makes the atlas of Kirchhoff far superior to the other for use in the observatory.

The numbers in the fourth column are intended to denote the percentage of frequency with which the corresponding lines are visible in my instrument. They are to be regarded as only roughly approximative; it would of course require a much longer period of observation to furnish results of this kind worthy of much confidence.

In the fifth column the numbers denote the relative brilliance of the lines on a scale where 100 is the brightest and 1 the faintest. These numbers also, like those in the preceding column, are entitled to very little weight.

Ref. No.	Kirchhoff.	Angstrom.	Relative Frequency.	Relative Brightness.	Chemical Element.	Previous Observer.
1	534·5	7060·?	60	3		
2	654·5	6677·?	8	4		L.
3	C	6561·8	100	100	H.	L. J.
4	719·0	6495·7	2	2	Ba.	
5	734·0	6454·5	2	3		
6	743·?	6431.	2	2		
7	768·?	6370·	2	2		
8	816·8	6260·3	1	1	Ti.	
9	820·0	6253·2	1	2	Fe.	
10	874·2	6140·5	6	8	Ba.	L.
11	D_1	5894·8	10	10	Na.	L.
12	D_2	5889·0	10	10	Na.	L.
*13	1017·0	5871·	100	75		L. J.
14	1274·3	5534·0	6	8	Ba.	R. L.
15	1281·5	5526·0	1	1	Fe.	
16	1343·5	5454·5	1	2	Fe.	
17	1351·3	5445·9	1	2	Fe. Ti.	
18	1363·1	5433·0	1	1	Fe.	
*19	1366·0	5430·0	2	3		
20	1372·0	5424·5	3	4	Ba.	L.
21	1378·5 ?	5418·0 ?	1	2	Ti. ?	
*22	1382·5	5412·	1	1		
23	1391·2	5403·0	2	2	Fe. Ti.	
24	1397·8	5396·2	1	2	Fe.	
25	1421·5	5370·4	1	2	Fe.	R.
26	1431·3	5360·6	2	2		R. ?
27	1454·7	5332·0	2	2	Ti.	
28	1462·9	5327·7	1	3	Fe.	
29	1463·4	5327·2	1	3	Fe.	
30	1465·0 ?	5321·	2	2		
31	Corona line 1474·1	5315·9	75	15	Fe ?	L.

---

* Reprinted from the *American Journal of Science and Arts.*